



Ocean Observatories Initiative

Ocean Observatories Initiative Transition to a New Prime Awardee

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Agenda

- OOI Primer
- OOI Operations
- Transition Schedule
- Transition Activities

OOI System of Systems

- Integrated infrastructure of science-driven platforms & sensors
- Measures physical, chemical, geological, & biological properties from seafloor to air-sea interface
- Collects measurements at multiple scales:
 - From ocean basin to tidal basin
 - Short-term, stochastic events and large-scale decadal cycles
- Delivers free-access data to a vast user community, much of it in real time
- Expandable architecture accommodates technical advances and 3rd party technology

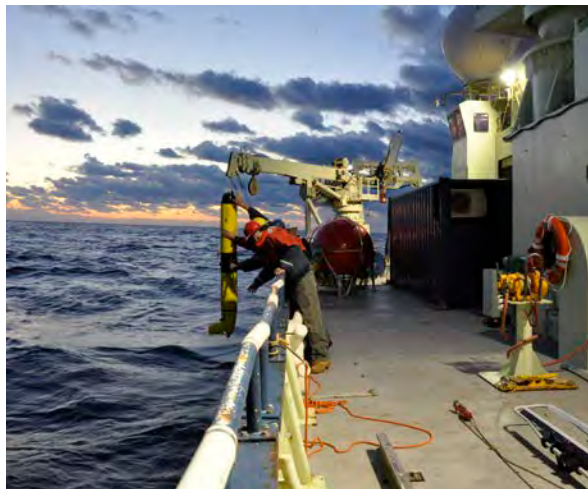
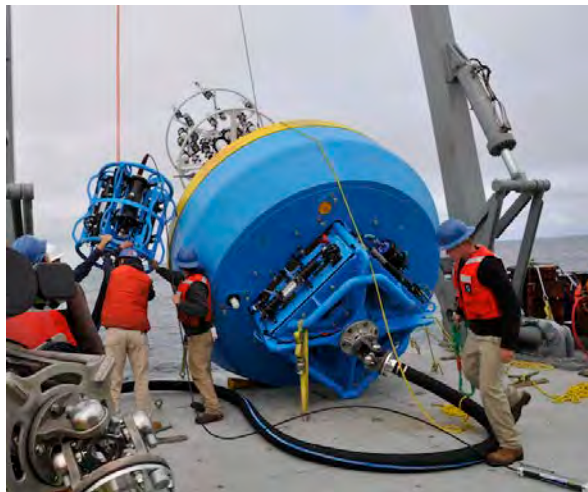


Science Themes

- Ocean-atmosphere exchange
- Climate variability, ocean circulation, and ecosystems
- Turbulent mixing and biophysical interactions
- Coastal ocean dynamics and ecosystems
- Fluid-Rock interactions and sub-seafloor biosphere
- Plate-scale geodynamics



OOI Operations: Recover/Deploy Cruises

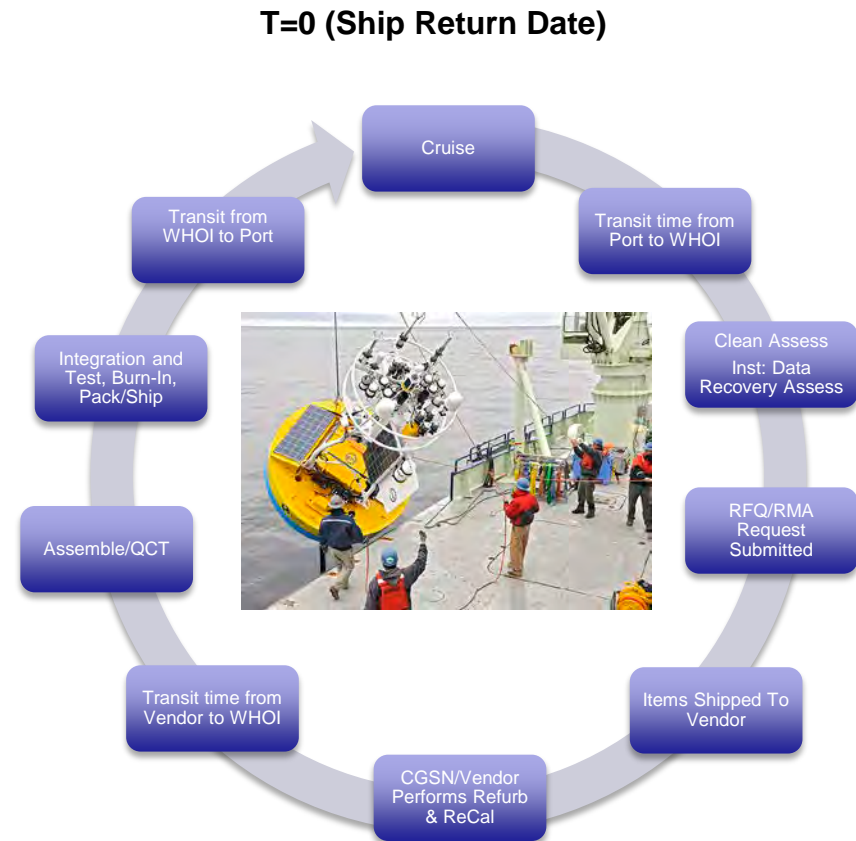


OOI Operations: Recover/Deploy Cruises



OOI Operations: Recover/Deploy Cruise Schedule

- 5 Major Annual Coastal Cruises
 - Pioneer and Endurance Arrays: Spring and Fall Cruises
 - Cabled Array: Summer Cruise
- 3 Major Annual Global Cruises
 - Papa Array: Summer Cruise
 - Irminger Cruise: Summer/Fall Cruise
 - Southern Ocean: Fall/Winter Cruise
- Minor Coastal Cruises
 - Provide Vehicle and Reduced Mooring Operations.



OOI Operations: Refurbishment



OOI Operations: Command, Control and Monitoring

CP01CNSM (D0008) (last update: 3/7/18 9:04am UTC)

Deployment: D0008 Disposition: Deployed

Alert History

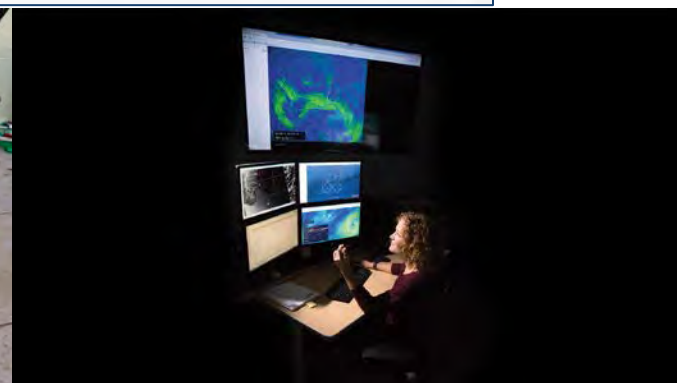
Date	Asset	Alert	Status	View
1/27/18 11:15pm UTC	CP01CNSM	TEST - GNSM Low Power L3	Open	View
12/18/17 5:30pm UTC	FB250	FB link attempts >2	Open	View
12/14/17 3:22pm UTC	CP01CNSM	CTD mass update	Open	View
12/13/17 4:45pm UTC	CP01CNSM	TEST - GNSM Low % Charge	Open	View
12/13/17 4:45pm UTC	WAVSS	TEST - GNSM Medium Wave Height	Open	View

Platform Status

BUOY	NSIF		MFN		
	CPM1	CPM2	CPM3	CPM3	
DCL11	DCL12	DCL26	DCL27	DCL36	DCL37
1 MOPAK	1: 1:	1: 1:	1 OPTAA1	1 ADCP	1 OPTAA2
2 HYD1	2: 2:	2: 2:	2 FLORT	2 PRESF	2: 2:
3 RTE	3 HYD2	3: 3:	3 CTDBP1	3: 3:	3 CTDBP2
4: 4:	4 PCO2A	4 VELPT1	4 DOSTA1	4 VELPT2	4 DOSTA2
5: 5:	5 WAVSS	5: 5:	5: 5:	5 PCO2W	5: 5:
6 METBK1	6 METBK2	6 PHSEN1	6: 6:	6 PHSEN2	6: 6:
7 METHTR1	7 METHTR2	7 NUTNR	7: 7:	7: 7:	7 ZPLSC
8: 8:	8 FDCHP	8 SPKIR	8: 8:	8: 8:	8: 8:

Status Change Log

Date	Asset	Status	Reason
12/14/17 3:22:52 pm	CP01CNSM	Critical	All CTD cals are being updated in CI. Reprocessing of CTDBP & CTDMO data will be needed. Contact: rtravis@whoi.edu



OOI Transition Schedule: Phase I to Phase II

Phase I: September 2009 through 30 September 2018

ARRA, MREFC and O&M Funding

Design, Build and Deployments of 7 Arrays X 2 Sets

PMO is Consortium for Ocean Leadership (COL)

Transition Phase: 1 June through 30 September 2018

Phase 2: 1 October 2018 through 30 September 2023

\$220M Funding for 5 Years

PMO is Woods Hole Oceanographic Institution (WHOI)


Transition Activities

- Stand Up new PMO at WHOI
- Annual Work Plan for PY I
- Community Engagement Plan
- Establishment of Program Metrics
- CM System Replacement
- Cyberinfrastructure (CI) Analysis of Alternatives Plan
- Subaward Financial Monitoring
- Cost Estimating Plan
- Agreements with Subawardees
- Re-assignment of Leases
- Assumption of custody for Equipment
- EHS and Cybersecurity Plans
- Documentation Updates

Responsibilities of the PMO

- Overall Coordination/Direction of OOI Activities
- Communication with NSF
- Community Engagement
- Engineering Metrics
- Obsolescence/Tech Refresh/Vendor Quality
- Data Delivery/CI
- Change Control Board
- Memorandums of Negotiation
- Annual Work Plan
- Cost Estimating Plan
- Quarterly & Annual Reporting
- Subaward and Financial Monitoring

OOI 1.0 PMO Organization (Sept 2009 – Sept 2018)

 Program Support

NSF Division of Ocean Sciences
 Program Directors (GEO/OCE): Clough & Houtman
 Grant & Agreement Specialist (DACS): Spencer
 Large Facilities Advisor (LFO): Hengst

OOI Facilities Board
 OOIFB Chair: Atkinson
 OOIFB Members

OOI Project Management Office
 Consortium for Ocean Leadership
 OOI 1.0 Program Director & Principal Investigator: Rutherford
 Mgr, OOI Business Operations: Shek
 Safety/Quality Mgr: Anderson
 Assoc. Project Manager: Banahan
 Property Manager: Donahue

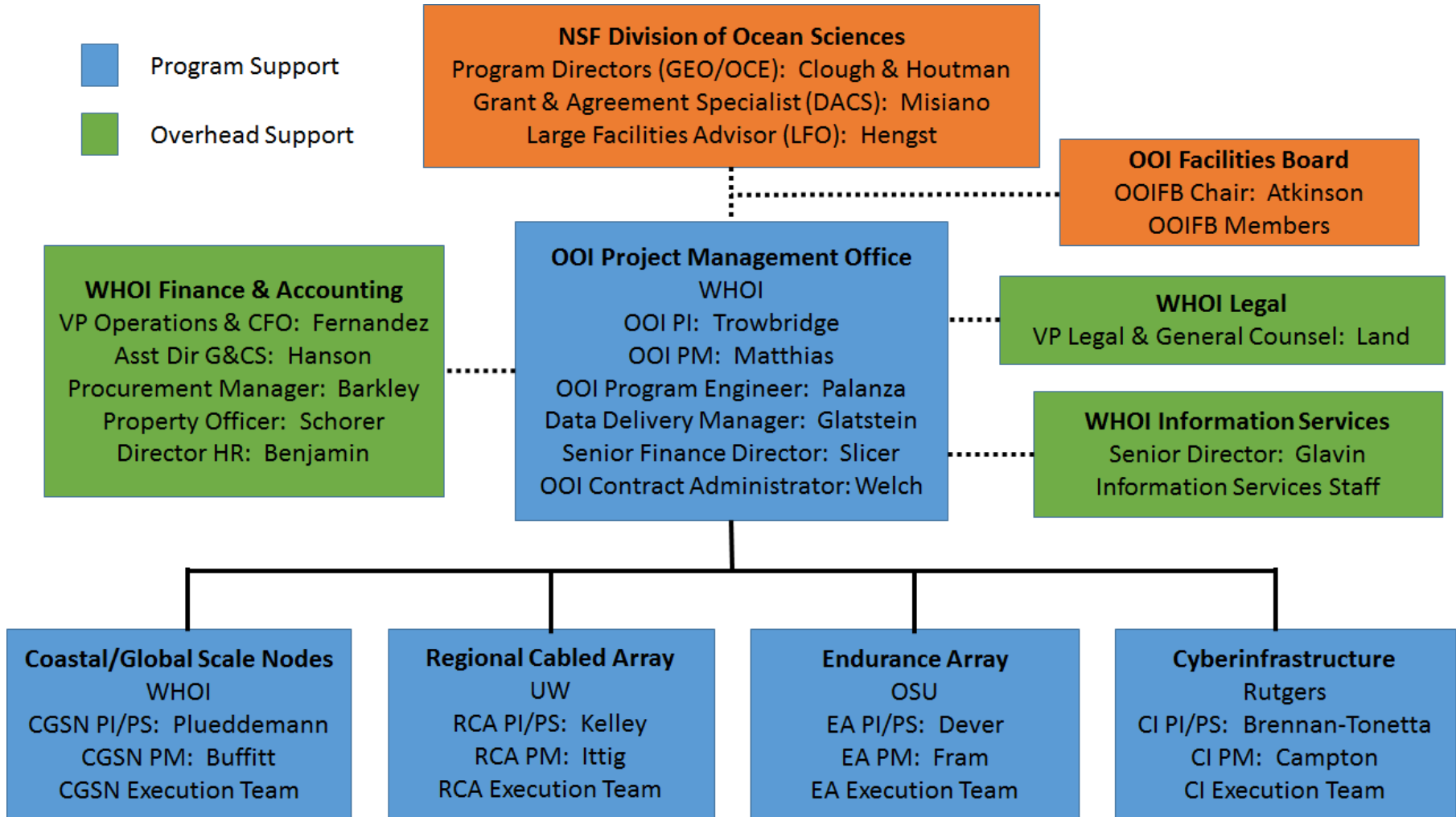
Coastal/Global Scale Nodes
 WHOI
 CGSN PI/PS: Plueddemann
 CGSN PM: Matthias
 CGSN Execution Team

Regional Cabled Array
 UW
 RCA PI/PS: Kelley
 RCA PM: Ittig
 RCA Execution Team

Endurance Array
 OSU
 EA PI/PS: Dever
 EA PM: Fram
 EA Execution Team

Cyberinfrastructure
 Rutgers
 CI PI/PS: Brennan-Tonetta
 CI PM: Campton
 CI Execution Team

OOI 2.0 PMO Organization (Oct 2018 – Sept 2023)



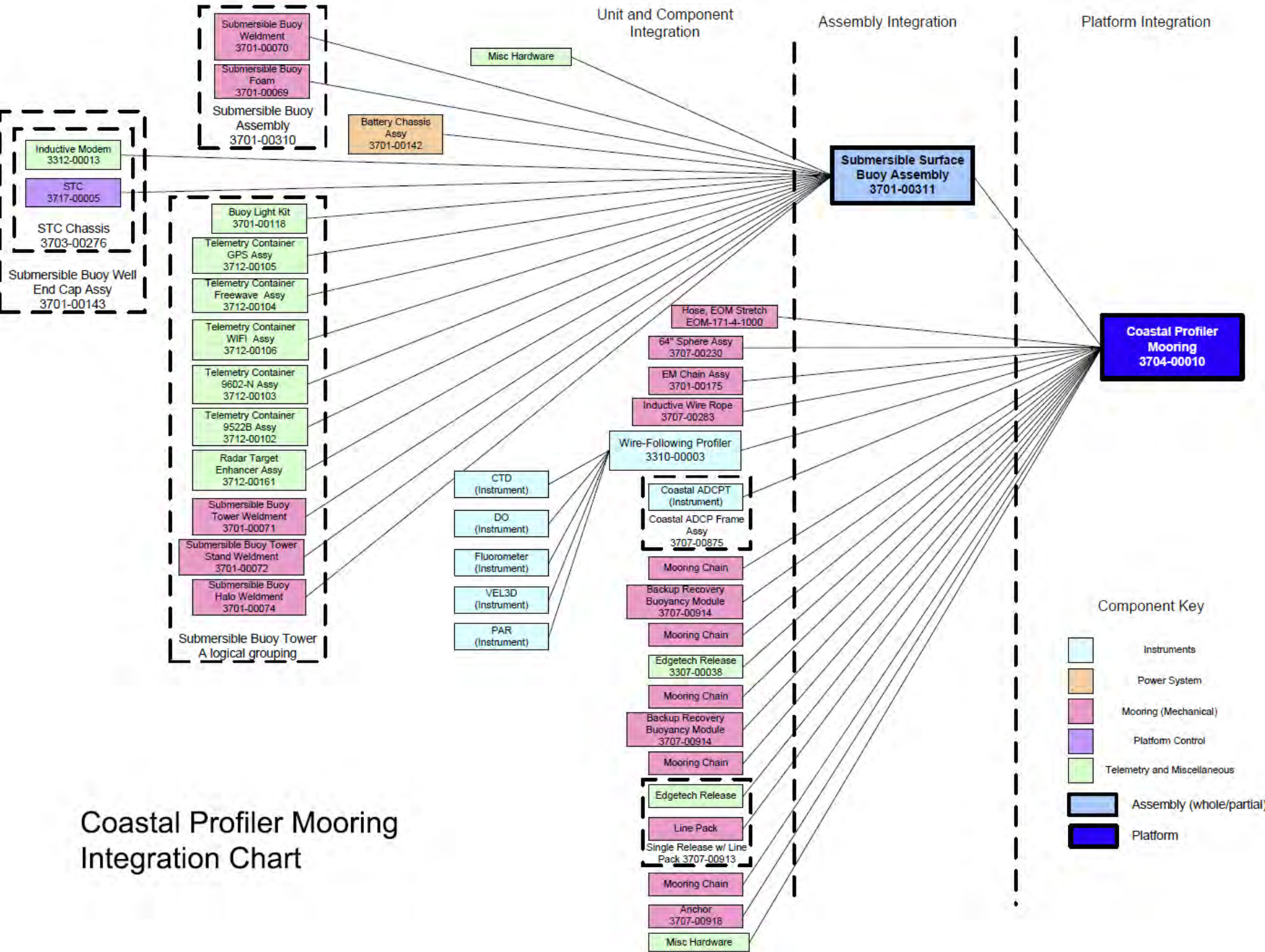
AWP: Cost Books

- Cost Books for Each Element and Array
 - Build and Integrate Flow Diagrams
 - Map of all units, components, assemblies and platform, with drawing numbers
 - Diagram of logical flow of Build, Integration and Test
 - Designation of Instruments, Electronics and Mechanicals
 - Element Cost Sheet
 - Summary of Activity, with Labor and Non-Labor Costs;
 - Total Element or Sub-System Cost to Build or Refurbish
 - Links of Labor Costs to Activity Detail Sheets
 - Links of Non-Labor Costs to an Extended Bill of Materials (BOM)
 - Labor to Non-Labor Ratio for each Item
 - Activity Detail Sheets; breakdown of each Activity into tasks, based on actuals
 - Rollup of all task hours on the Mooring or Sub-System Cost Sheet
 - Extended BOM

Unit and Component Integration

Assembly Integration

Platform Integration



Component Key

- Instruments
- Power System
- Mooring (Mechanical)
- Platform Control
- Telemetry and Miscellaneous
- Assembly (whole/partial)
- Platform

Coastal Profiler Mooring Integration Chart

Community Engagement Plan

- Role models:
 - International Ocean Discovery Program (IODP) – community
 - Ocean Networks Canada (ONC) – metrics
 - National Ecological Observatory Network (NEON) – well developed Community Engagement, Communications, and Evaluation Plans
- Goals:
 - Optimize the OOI
 - Build a robust, active, and inclusive OOI user community
 - Cultivate future OOI users

Program Engineer Responsibilities

- Performance Metrics
- Vendor Quality
 - Vendor Performance
 - Quality Control
 - Delivery schedule
- Obsolescence / Aging Components
- Reliability
- Continual Improvement Process
- Reports for three different users:
 - MIO: System Improvement
 - PMO: Remediation, System Improvement
 - NSF: Summary of Percent Operational

Performance Metrics

- Identify Common Key Performance Indicators (KPI's) For Platforms and Instruments
- Apply KPI's to Operational History
 - Prioritize Vendor efforts
 - System Uptime: Historical Performance
 - Mean Time Between Failures (MTBF) Statistics
- Evaluate Metrics to:
 - Develop Product Life Cycle Efficiencies
 - Refurbishment Activities
 - Deployments
 - Work Flows
 - Inform Technology Refresh and Annual and Long Range Work Plans

Analysis of Alternatives (AoA)

- An objective evaluation of alternative requirements, architectures, design approaches, or solutions using identical ground rules and criteria.
- Employs a structured, analytical framework to help ensure a rational, unbiased decision is made.
- Used for evaluating two or more alternatives used when:
 - Key Program decisions need to be made
 - Major program impacts are involved
 - Design drivers need to be identified/considered
 - Off the Shelf Candidate Solutions are being evaluated
 - A Design Alternative that best satisfies the Program Requirements is selected and documented.
- Supports Defendable Program decisions based on Stakeholder Engagement.

Configuration Management (CM) AoA

- OOI 1.0 CM Tool is Software Application Framework (SAF)
- SAF is unstable and difficult to maintain.
- SAF is no longer supported by the vendor.

CI Analysis of Alternatives (AoA)

- Characteristics
 - Clear Problem Statement
 - Requirement Specification
 - Ground rules and assumptions
 - Evaluation Criteria established upfront
 - Weights and Scoring
 - Schedule
 - Potential Solutions
 - Technical Recommendation
 - Documentation of Decision

CM AoA

	Weight	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
		SAF	Service Now	Aras	Autodesk Vault	Issuetrak	Atlassian - JIRA Core
Lead Time to implement	10%	10	8	3	8	3	9
Cost to implement	10%	5	8	0		5	10
Administrative Functions	15%	26	36	9	15	7	34
Multiple levels of access		9	9		6		7
Ability to create user groups			9			0	9
Ability to change ECR fields (status, author, etc.)		8	9			0	9
Ability to post attachments (where to they live)		9	9	9	9	7	9
Change Control Board	20%	27	25	21	11	6	27
Ability to manage membership for different Boards		9	9	8	6		9
Ability to schedule Boards attach ECRs		9	9	8	0	6	9
Ability to capture attendance, votes, liens		9	7	5	5		9
ECR Functions	20%	72	64	9	54	32	81
Auto numbering of ECRs for different boards		9	9	9	9	3	9
Multiple state options		9	9		9	8	9
Ability for people besides author to view/edit ECR (<i>should</i>)		0	9		9		9
Ability to add additional reviewers		9	9		9		9
Ability for reviewer comments to be added		9	9		9	8	9
Ability to capture/check-off liens and actions		9	7			8	9
Ability to have pre-defined workflows		9	4		9		9
Ability to promote to next Board		9	8		0	5	9
Ability to print		9			0		9
Notification Functions	5%	9	9	0	9	9	9
Auto email alerts for actions		9	9		9	9	9
Searching & Reporting	10%	18	18	0	18	14	18
All fields in an ECR should be searchable		9	9		9	7	9
ECR searches should be filterable by fields		9	9		9	7	9
Access/Connectivity	10%	18	7	0	7	7	16
Must be accessible by personnel outside of WHOI		9	7		7	7	9
Ability to interface with Alfresco (DMS) (<i>should</i>)		9	0		0	0	7
	100%	29.25	27.75	7.65	19	12	32.45

OOI CI Analysis of Alternatives evaluation work sheet

Weight total should equal 100

Grade is on a scale of 0-1 with 1 being most favorable (quarter points can be used)

The highest score represents the best percentage out of a hundred

		OOI				Integrated				
Vendor										
Telephone										
Web										
Contact										
License Model										
Add-on Modules with cost										
Licenses Required										
Cost										
Maintenance										
Support Models and Cost										
Discounts										
Overall Cost										
Product Name										
Requirement / Capability	Weight	Grade	Weighted Grade	Grade	Weighted Grade	Grade	Weighted Grade	Grade	Weighted Grade	Comments
Infrastructure		10.0%								
Cloud Architecture	5.0%		0		0		0		0	This is new to OOI. We would need to justify to NSF that it is important (JPF).
Can act as operator	5.0%		0		0		0		0	It would be great to have long-term tech support by the developer, which would be available from a developer capable of acting as an operator. I would be reluctant to give up control of operations (JPF).
Easily maintained	17.5%		0		0		0		0	
Easily extended	17.5%		0		0		0		0	
Ability to change algorithm or source code	10.0%		0		0		0		0	at user level?
Easily discoverable information (outside of database)	10.0%		0		0		0		0	good information architecture, search
Ability to handle real-time or near real-time data	20.0%		0		0		0		0	
Command and control for operators	5.0%		0		0		0		0	This needs to be defined (JMG) and secure (MV) - ability to turn instrument on/off, change sampling rates, and modify settings (MV)
Single point of information entry	10.0%		0		0		0		0	Back-end ability to add instrument data, documentation, and other data types (MV); including code configuration variables and information for backend plumbing/integration (SMP)
Sub Total	100.0%	0	0%	0	0%	0	0%	0	0%	
Data Store		15.0%								
Works with current databases	17.5%		0		0		0		0	This includes the ability to port from current technology easily - Non starter if this isn't met
Strong algorithm development	15.0%		0		0		0		0	This includes QC algorithms/plugins
Algorithm logic controls for users	10.0%		0		0		0		0	Operator ability to go into system and change algorithm logic in real-time without a software update (this would need strict permissions and version control)
Strong data entry interface	10.0%		0		0		0		0	Simple front-end UI design for data entry
Ability to manage data in place with versioning options	15.0%		0		0		0		0	

Elements of Financial Monitoring

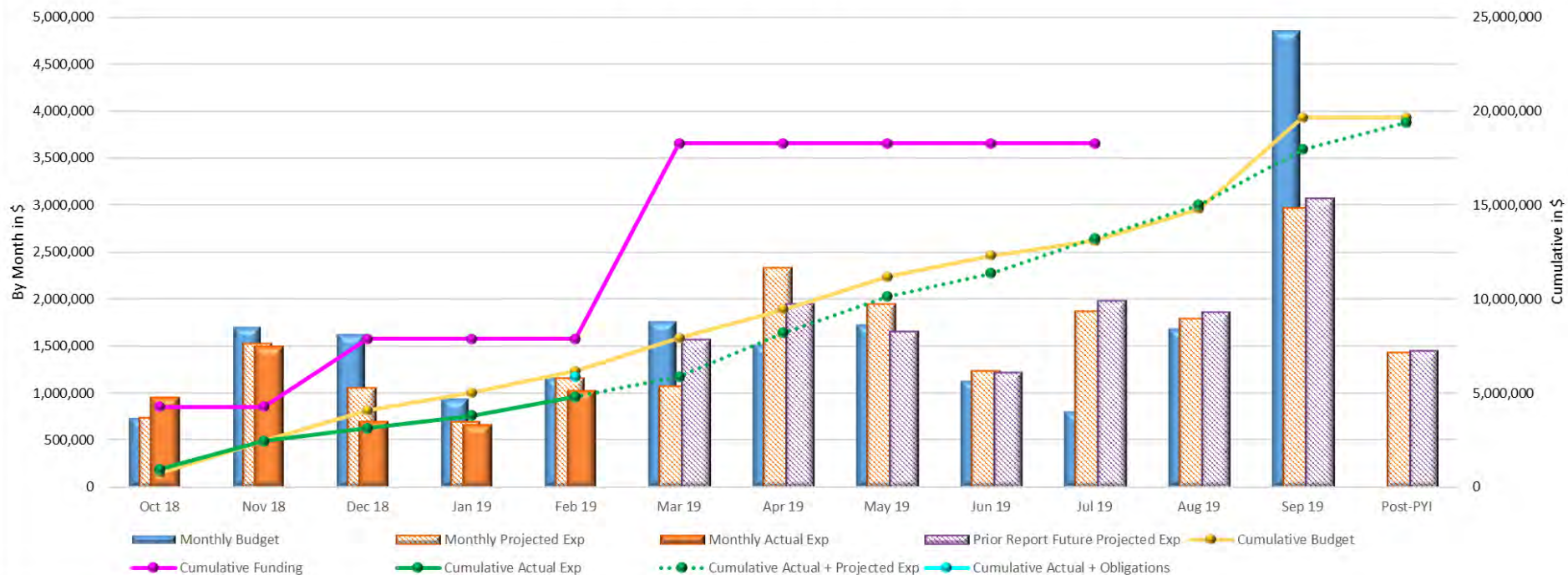
- Monthly Invoice
 - Financial Status Report (FSR)
 - Posted Transaction List
 - Posted Transactions in relation to MON requirements
 - Payroll data
- Monthly FSR Analysis
 - More in-depth look at FSR information
 - annual & installment budgets, ECRs
 - procurement plan
 - outstanding obligations
 - projections
- Monthly Tracking Book

Tracking Book

- Monthly Deliverable, reviewed by PMO and IO
- IO- and OOI-based
- Contents
 - “Quad Chart”
 - Accomplishments – Last 30 Days
 - Risks/Obstacles/Opportunities
 - Preview – Next 30 Days
 - Scope and Budget Changes
 - 8 ETC/EAC Charts, for Labor and ODC
 - Total
 - LOE
 - Refurbishment Activities
 - Cruise
 - 5 Year MON Rolling Assessment
 - 1 Year MON Timeline

Total ETC/EAC

CGSN Total Project Year I, as of February 2019



TOTAL as of February 2019																
Description	Budget	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Post-PYI	Total	
Monthly Budget		735,669	1,700,327	1,625,258	940,005	1,163,419	1,764,339	1,512,187	1,727,719	1,131,739	804,253	1,683,507	4,852,404		19,640,825	
Cumulative Budget	19,640,825	735,669	2,435,997	4,061,255	5,001,259	6,164,678	7,929,017	9,441,204	11,168,923	12,300,662	13,104,914	14,788,422	19,640,825	19,640,825		
Cumulative Funding		4,256,211	4,256,211	7,884,527	7,884,527	7,884,527	18,269,552	18,269,552	18,269,552	18,269,552	18,269,552					
Description	Budget	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Post-PYI	ETC/EAC	Variance EAC/Bud
Monthly Actual Exp		948,346	1,485,169	695,661	653,594	1,016,548										
Monthly Projected Exp		735,668	1,525,041	1,047,976	691,446	1,149,618	1,064,302	2,326,053	1,942,391	1,228,808	1,862,883	1,783,072	2,956,915	1,431,679	14,596,104	
Prior Report Future Projected Exp							1,565,653	1,941,103	1,650,232	1,209,616	1,976,549	1,856,157	3,065,036	1,444,091		
Monthly Budget % Variance		-29%	13%	57%	30%	13%	40%	-54%	-12%	-9%	-132%	-6%	39%	-		
Cumulative Actual Exp	19,640,825	948,346	2,433,515	3,129,177	3,782,771	4,799,319										
Cumulative Actual + Projected Exp							5,863,621	8,189,675	10,132,066	11,360,874	13,223,757	15,006,829	17,963,744	19,395,423	19,395,423	
Cumulative Actual + Obligations						5,848,288									245,402	

OOI 2.0 Cost Estimating Plan

- A “living” document, developed as part of the OOI 2.0 Transition Activities
 - Previous OOI CEP had not been updated since 2009
- Submitted by WHOI as the prime awardee
 - Specifically covered PMO and WHOI program components
 - Subawardees incorporated by reference and subsequently developed their own CEPs and supporting documents using the WHOI submission as the basis
- Compilation of several already existing statements, resources, and documents that needed to be organized to meet the goals of the CEP.

OOI 2.0 Cost Estimating Plan

- Components of the OOI CEP:
 - Overview & Introduction
 - Objective of the Plan
 - Methods of Cost Estimation
 - Work Breakdown Structure
 - Cost Books and Basis of Estimates
 - Cost Categories
 - Management of Subawardees
 - Final Budget Development
 - GAO Cost Guide Elements
 - Appendices: Addt'l travel info, rate agreements, full WBS, WBS dictionary

OOI 2.0 Cost Estimating Plan

- Tips for Successful Completion:
 - Utilize the expertise of others. Even though all LF are unique, having a starting framework makes all the difference
 - OOI owes considerable thanks to Hannah Hanson from LIGO Laboratory
 - Understand what the CEP is....simply a living document describing how to develop and update cost estimates
 - Utilize existing institutional resources
 - Don't be afraid to ask questions and challenge current practices

QUESTIONS

